

FIG. 5

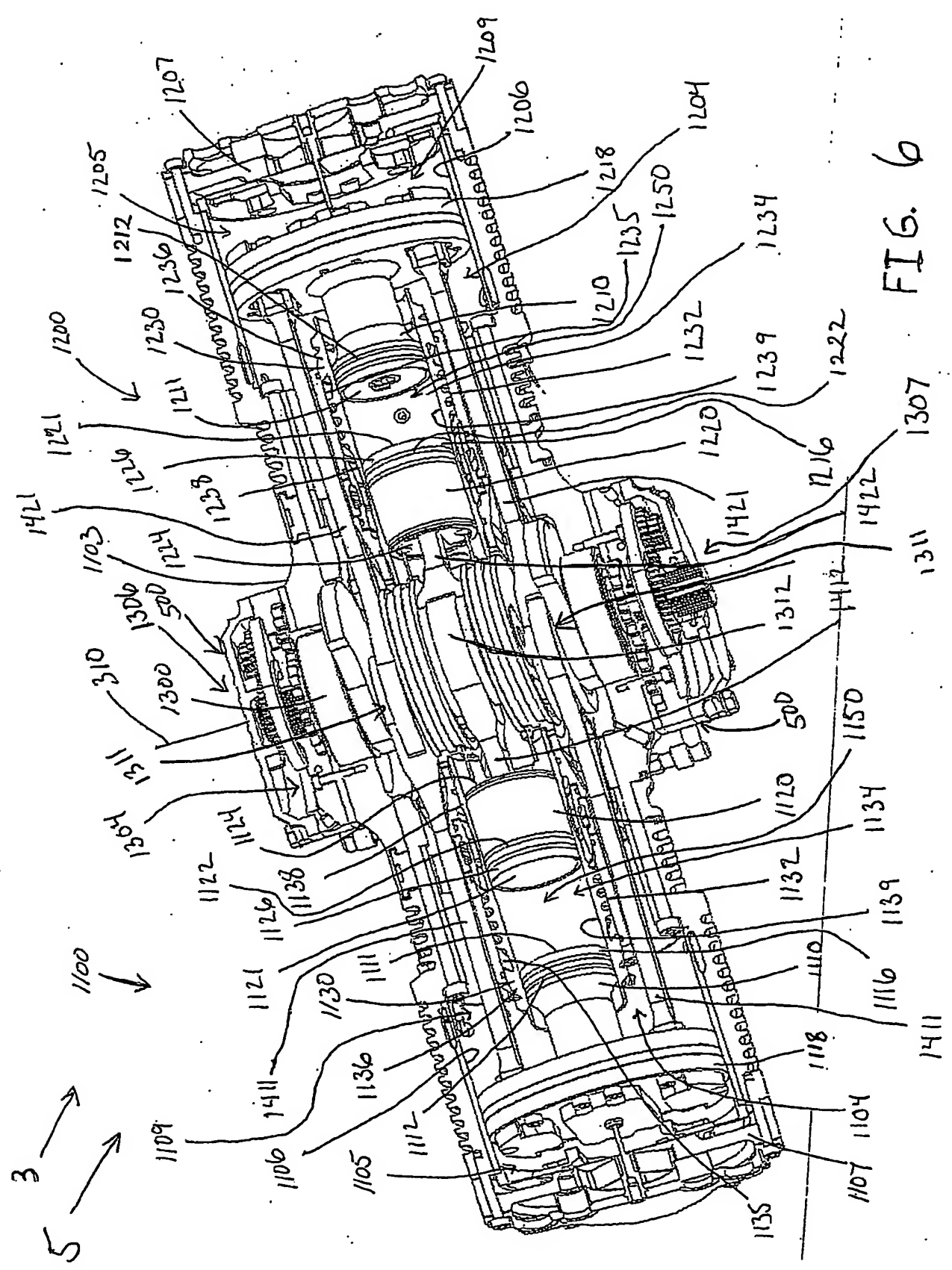


FIG. 6

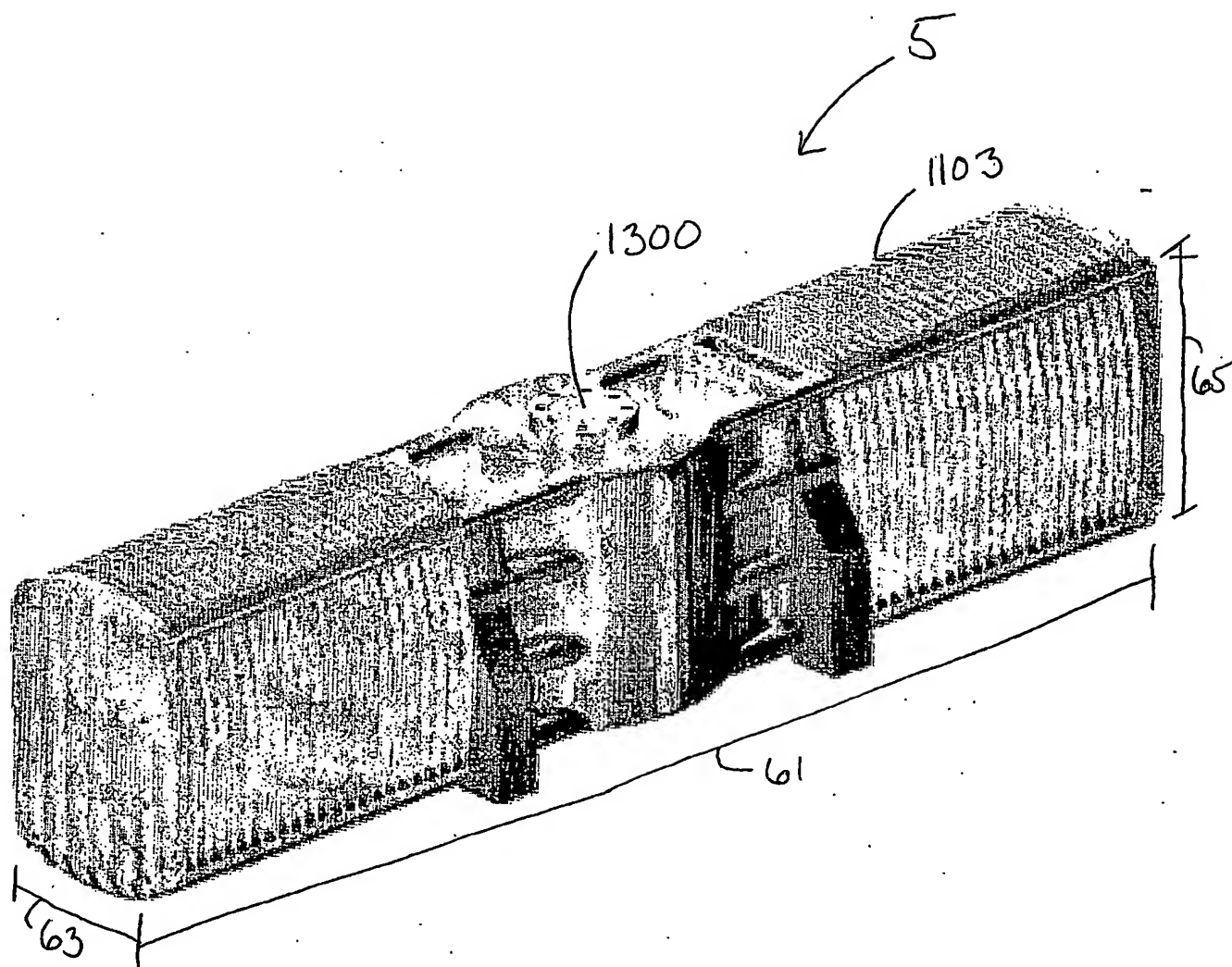
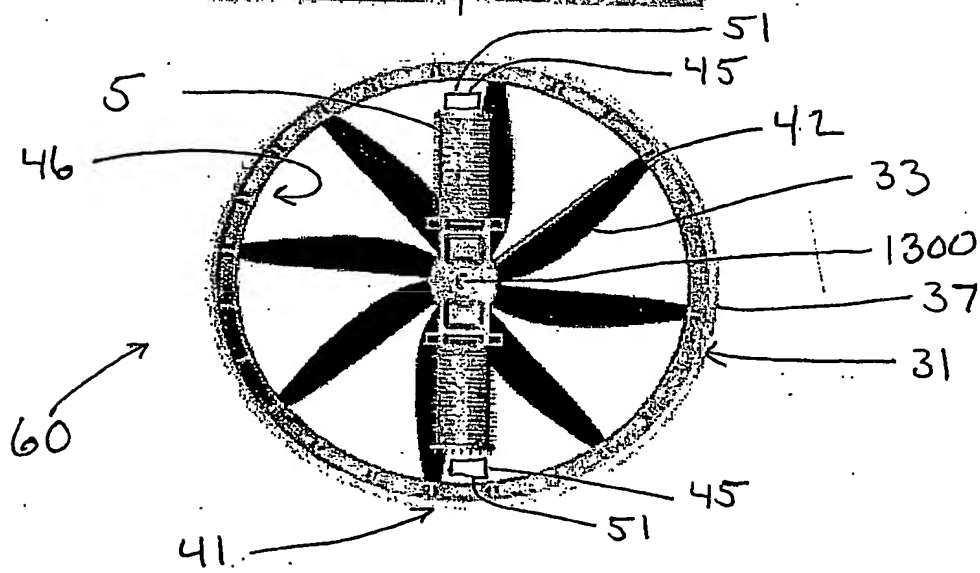
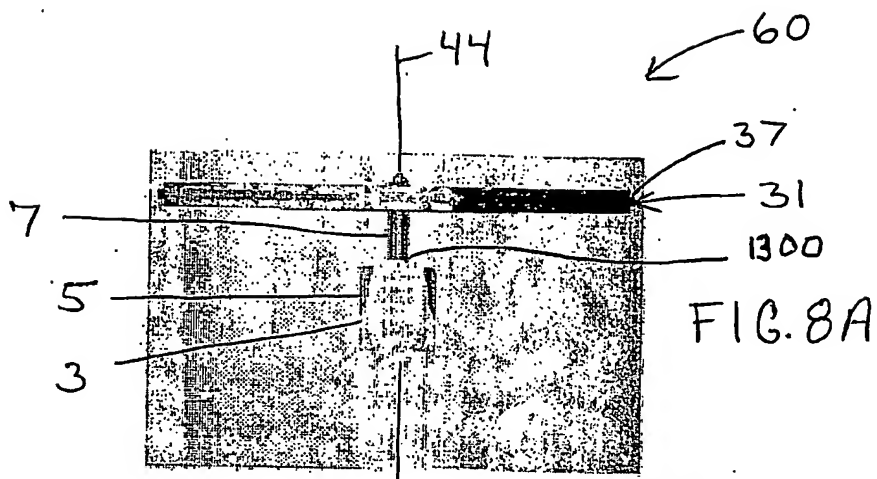


FIG. 7



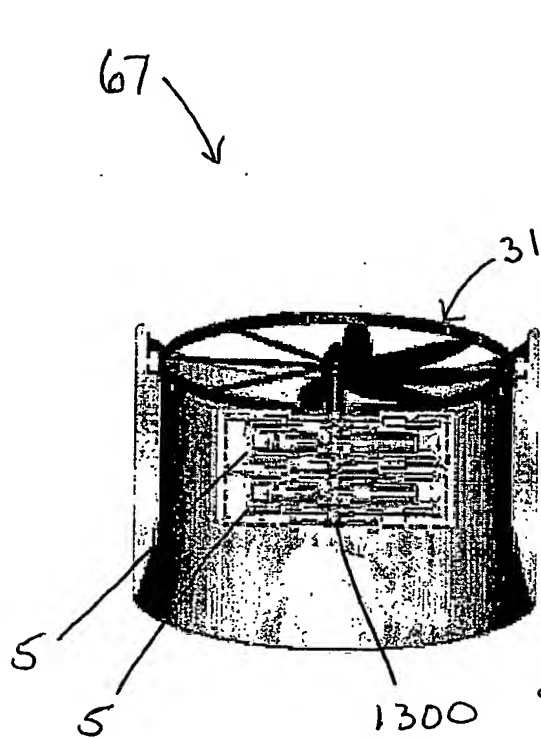


FIG. 9A

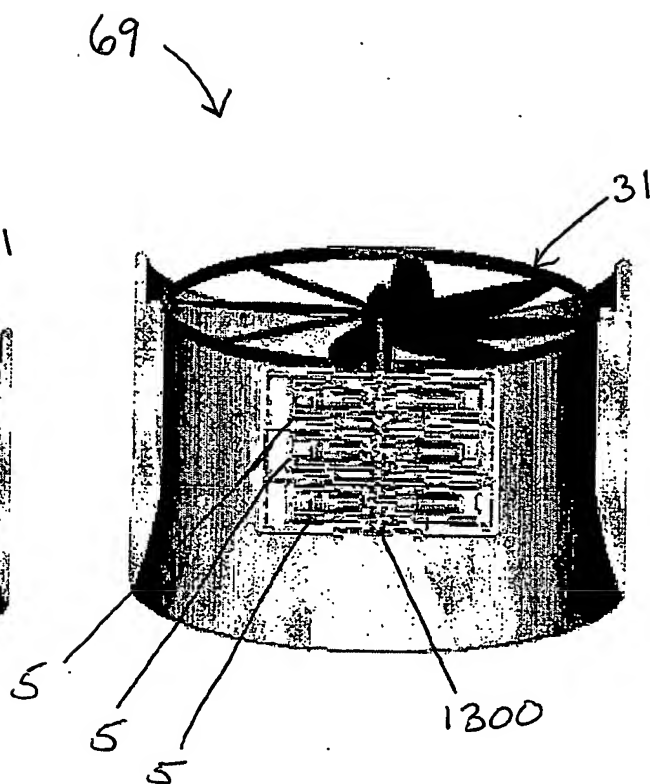


FIG. 9B

Engine Design Input Data

Cylinder Bore	B	32	mm
Engine Stroke	S	60	mm
Conrod Length	L	50	mm
Engine Speed	N	9182	rpm
Compression Ratio	CR	19	
Intake/Boost Pressure (abs)	Pi	0.94	bar
Intake/Boost Temperature	Ti	20	C
Fuel (D for diesel, G gasoline, M methanol)		d	
Stroke (FOUR for 4 stroke, TWO 2 stroke)		two	
Relative Air/Fuel ratio	Lambda	1.4	
Number of Cylinders	n	6	

Estimated Engine Performance Data

Cylinder Peak Pressure	Pmax	75	bar
Peak Pressure Phase (ATDC)	Alpha	6	deg
Break Mean Effective Pressure	BMEP	6.0	bar
Engine Power at the Given Speed	P	35.4	hp
Engine Torque at the Given Speed	T	27.5	Nm

FIG. 10

FIG. 11 OAV JP8 opoc Engine Families

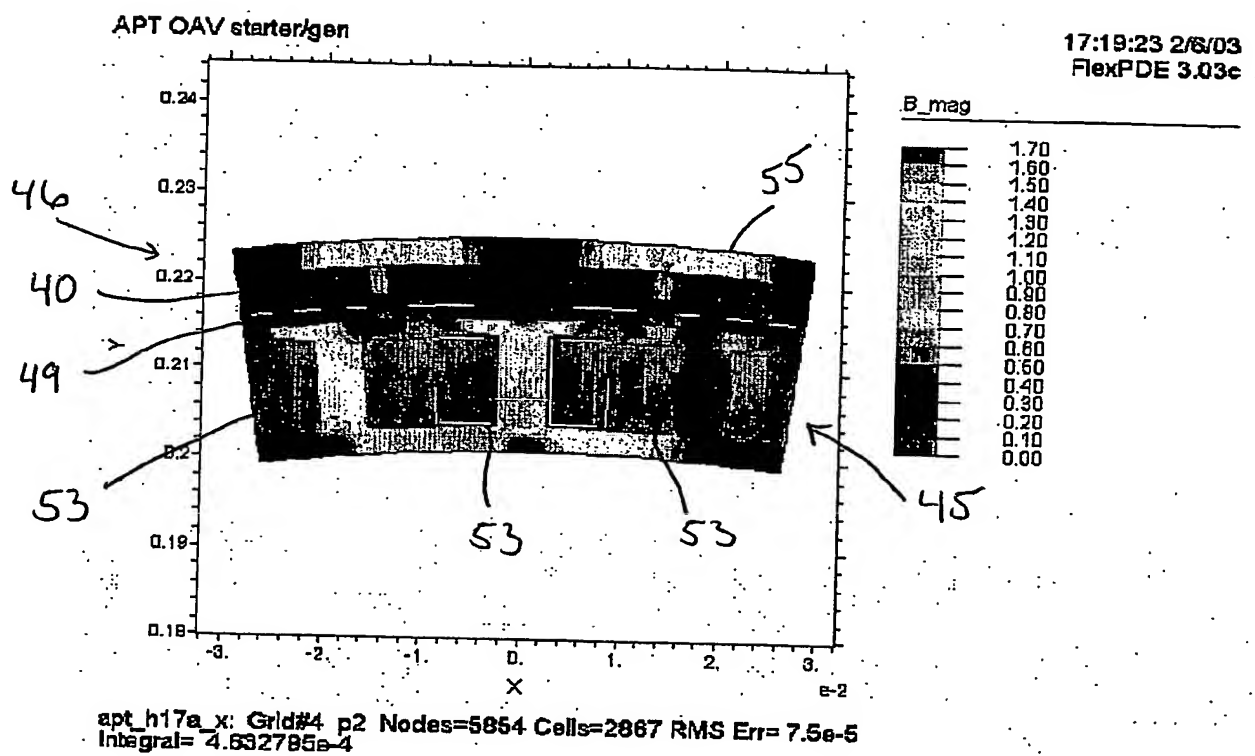
FAMILY 1a (preferred, the lightest two-cylinder units - opoc module, two gear-set)												
Cyl.	Mach	Speed	MPS	Piston Stroke		Power		opoc Weight		BSFC		Transmission
Nr.	Nr.	rpm	m/sec	cm	in	hp	kW	g	lbs	g/kWh	lbs/hp-hr	%
2	0.85	12500	11.0	2.64	1.04	9	6.7	1825	4.0	500	0.822	17%
4	0.85	12500	11.0	2.64	1.04	17	12.7	3950	8.7	480	0.789	18%
6	0.85	12500	11.0	2.64	1.04	42	31.3	7743	17.1	490	0.707	20%
											Gear-ratio: 1 =	
											0.66	
											Gear-ratio: 1 =	
											0.39	
											Planetary Transmission	

FAMILY 1b (only one standardized-cylinder-unit - opoc module, but three gear-set)												
Cyl.	Mach	Speed	MPS	Piston Stroke		Power		opoc Weight		BSFC		Transmission
Nr.	Nr.	rpm	m/sec	cm	in	hp	kW	g	lbs	g/kWh	lbs/hp-hr	%
2	0.68	10000	10.0	3.00	1.18	9	6.7	3150	6.9	450	0.740	19%
4	0.68	10000	10.0	3.00	1.18	17	12.7	6350	14.0	430	0.707	20%
6	0.748	11000	11.0	3.00	1.18	42	31.3	9550	21.1	400	0.658	21%
											Direct drive	
											Gear-ratio: 1 =	
											1.2	
											Gear-ratio: 1 =	
											2.08	
											Gear-ratio: 1 =	
											0.45	

FAMILY 2 (two-cylinder units - opoc modules, one gear-set, no 6 cylinder)												
Cyl.	Mach	Speed	MPS	Piston Stroke		Power		opoc Weight		BSFC		Transmission
Nr.	Nr.	rpm	m/sec	cm	in	hp	kW	g	lbs	g/kWh	lbs/hp-hr	%
2	0.85	12500	11.0	2.64	1.04	9	6.7	1825	4.0	500	0.822	17%
2	0.85	8300	11.0	3.98	1.57	17	12.7	5125	11.3	400	0.658	21%
4	0.85	8800	11.0	3.98	1.57	42	31.3	10900	23.4	380	0.625	23%
											Direct drive	
											Gear-ratio: 1 =	
											0.59	

FAMILY 3 (three-cylinder units - opoc modules, all direct drive and 2 cylinders)												
Cyl.	Mach	Speed	MPS	Piston Stroke		Power		opoc Weight		BSFC		Eff
Nr.	Nr.	rpm	m/sec	cm	in	hp	kW	g	lbs	g/kWh	lbs/hp-hr	%
2	0.85	12500	11.0	2.64	1.04	9	6.7	1825	4.0	500	0.822	17%
2	0.85	8300	11.0	3.98	1.57	17	12.7	5125	11.3	400	0.658	21%
2	0.85	4900	11.0	6.73	2.65	42	31.3	24950	55.0	340	0.559	25%
											Direct drive	
											Direct drive	
											Direct drive	

FIG. 12



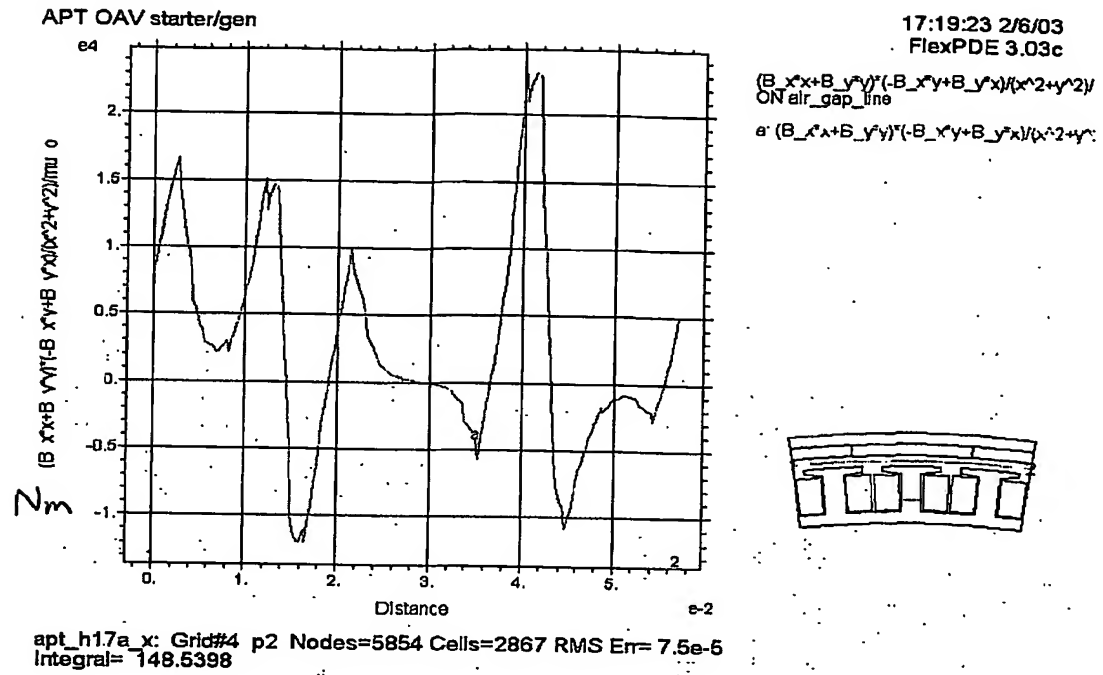


FIG. 13

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